

California Department of Transportation

Qualified Products List and Application Requirements
for Corrosion Protection Coverings
on Mechanical Butt Splices, Butt Welds and Lap Welds
for Epoxy Coated Reinforcement
12/02

The following products have been tested and are approved by the Division of Materials Engineering and Testing Services, Corrosion Technology Branch for use as corrosion protection coverings for mechanical butt splices, butt welds and lap welds on epoxy coated reinforcement. These products are approved for use when applied in accordance with the manufacturer's recommendations and the following requirements. When there is a conflict between the manufacturer's recommendations and these requirements, these requirements shall govern.

Other products will be considered for inclusion on this list subject to evaluation and the Corrosion Technology Branch.

The following table lists the headquarters office for each manufacturer of the approved product. Other offices and/or distributors of these approved products may exist. The amount of radial and longitudinal tubing shrinkage may vary for each product. These factors must be taken into consideration when selecting the diameter and length of tubing needed to achieve an adequate seal and appropriate bond length around the splice region. Shrink tubing size and corresponding bar/coupler sizes should follow the manufacturer's recommendations.

Table 1
Qualified Products List

Shrink Tubing Manufacturer	Product Description	Manufacturer's Phone Number
Canusa-DSG 173 Commerce Blvd., Cincinnati, Ohio 45140 www.dsgcanusa.com	CFW Heat Shrinkable Tubing (with thermoplastic liner)	800-422-6872
Tyco Adhesives Corrosion Protection Group 1400 Providence Hwy. Norwood, MA 02062 www.TycoAdhesives.com	CPSM Heat Shrinkable Tubing	800-248-0149

Application Requirements:

- 1) The shrink tubing must be installed as a continuous tube. Cutting the tube lengthwise and wrapping it around the splice region will not be permitted.
- 2) All sharp edges and burrs that may damage the shrink tubing shall be removed from the coupler and/or rebar prior to applying the shrink tubing. Grinding of welds and/or couplers shall be done in accordance with Caltrans acceptable practices and/or manufacturer's procedures (for mechanical splices).
- 3) The products listed in Table 1 have a mastic material on the inside surface of the shrink tubing. The mastic material provides a water tight seal when the tubing is shrunk. The inside surface of the shrink tubing must be kept free of foreign debris prior to and during application. Foreign debris within the shrink tubing may interfere with the mastic seal.
- 4) All portions of the bar and coupler that will be in contact with the shrink tubing shall be preheated to a minimum preheat temperature of 100 °C (212 °F). All oil, dirt, grease, solvents, or other deleterious material shall be removed from the mechanical splice, bar or weld immediately prior to pre-heating. The epoxy coating on the reinforcement shall not be heated above 121 °C (250 °F). The contractor shall monitor the preheat temperature with a heat sensor gun, temperature indicating crayon, or other method approved by the Engineer. The shrink tubing shall be applied before the pre-heated area has cooled below the minimum pre-heat temperature.
- 5) The shrink tubing shall be uniformly heated from the center of the spliced region outward, until the tubing is completely shrunk and the mastic material is protruding from both ends of the tubing. The heating method shall not burn or damage the shrink tubing. The minimum and maximum shrink temperatures for each shrink tubing shall follow the manufacturer's recommendations.
- 6) All shrink tubing (after shrinking) shall extend a minimum of 50 mm (2 in) onto the epoxy coated region of the bar.
- 7) Shop applied shrink tubing with cuts, tears, pinholes, or other defects prior to shipping shall be rejected. Upon rejection, the shrink tubing shall be removed and a new shrink tubing applied.

- 8) Damage to the shrink tubing occurring during shipping or in the field shall be repaired to the satisfaction of the Engineer using one of the following methods:

- Clean and dry the damaged tubing and bar surface. Apply Scotchrap #50 All-Weather Corrosion Protection Tape over the entire length of the in-place tubing beginning and ending with a minimum 50 mm (2 inch) overlap onto the reinforcement at each end of the tubing. Repair tape should be tightly wrapped in a spiral fashion with each wrap overlapping the previous wrap by 1/2 the width of the repair tape.
- Clean and dry the damaged tubing and bar surface. Apply Scotchkote Brand Electrical Coating (liquid), according to the manufacturers recommendations, onto the damaged area. The repair coating should be brushed on and should extend a minimum of 25 mm (1 inch) beyond all edges of the damaged area. Repaired areas must be allowed to dry a minimum of 24 hours prior to contact with water or concrete.

Scotchrap #50 All-Weather Corrosion Protection Tape and Scotchkote Brand Electrical Coating (liquid) are products of the 3M Corporation 6801 River Place Blvd. Austin, Texas 78726, Phone number: 1-800-722-6721.

- 9) Excessively damaged shrink tubing, as determined by the Engineer, shall be rejected. Upon rejection, the shrink tubing shall be removed and a new shrink tubing shall be applied.